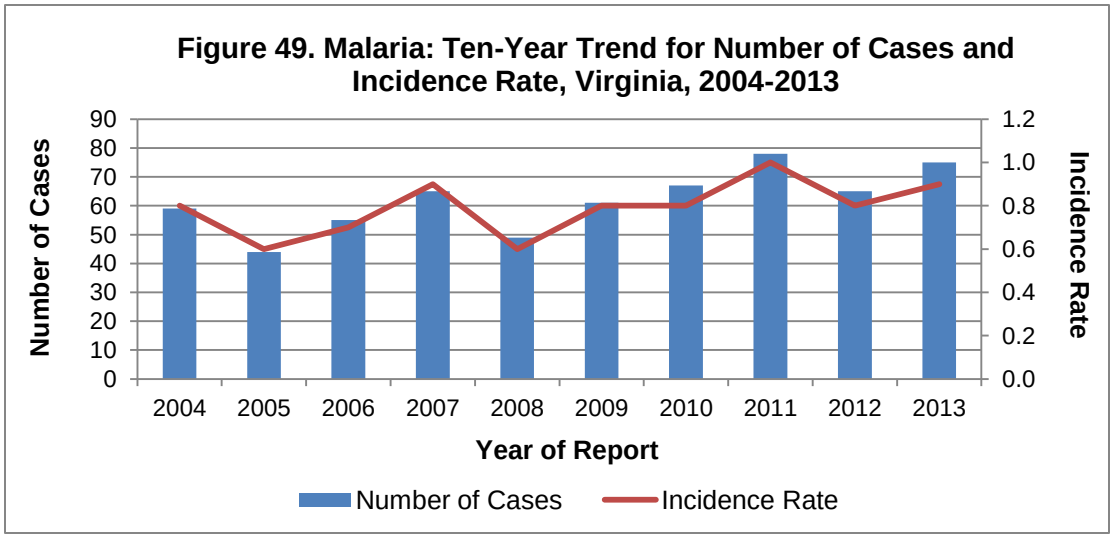
Malaria

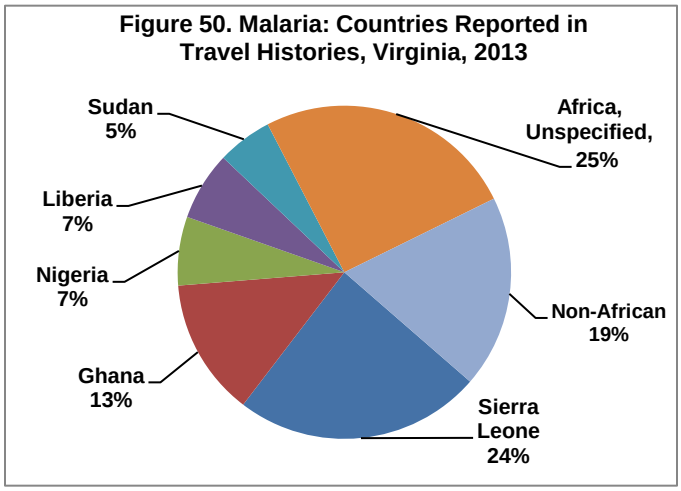
Agent(s): Four different species of protozoan parasites: *Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale,* and *Plasmodium malariae*
Mode of Transmission: Transmission through the bite of an infected female *Anopheles* mosquito. Transmission might also occur from infected mother to child during pregnancy or delivery, by blood product transfusion or through transplanted organs from infected donors. Humans and certain *Anopheles* mosquito species are the only natural reservoirs for malaria.
Signs/Symptoms: Typically, high fevers, chills, sweats, severe headache, muscle and joint pain, anorexia, nausea, flu-like illness, anemia and an enlarged spleen. *P. falciparum* infections may progress to severe malaria if not treated promptly; symptoms include acute alteration of brain structure and function (i.e., cerebral malaria), severe anemia, jaundice, renal failure and coma.
Prevention: Appropriate medication for malaria prophylaxis should be taken by travelers when traveling to malaria-endemic countries. Anopheline mosquitoes bite only at dusk, dawn or during night-time hours and tend to enter buildings. Control measures include staying in structures with adequate screening and bed nets, and when outdoors, wearing long-sleeved, loose-fitting, light-colored clothing and mosquito repellents.
Other Important Information: Almost all infections reported in Virginia occur in persons who were infected in other countries. Although malaria is not endemic to Virginia, it may be brought to this region by travelers or immigrants with dormant or inapparent infections. Malaria might also arrive in Virginia with infected mosquitoes transported in aircraft or ships arriving from foreign destinations. Two potential mosquito vectors for malaria are present in Virginia: *Anopheles quadrimaculatus* and *An. punctipennis*.

Malaria: 2013 Data Summary	
Number of Cases:	75
5-Year Average Number of Cases:	64.0
% Change from 5-Year Average:	+17%
Incidence Rate per 100,000:	0.9

During 2013, 75 cases of malaria were reported in Virginia. This is a 15% increase from the 65 cases reported in 2012, and a 17% increase from the five-year average of 64.0 cases per year (Figure 49). Incidence was highest in the 30-39 year age group (1.8 per 100,000), followed by the 1-9 and 10-29 year age groups (1.2 and 1.1 cases per 100,000, respectively). Race was not reported for 20% of cases. Where race information was reported, incidence in the black population (2.8 per 100,000) was substantially higher than rates for the "other" race population (0.7 per 100,000) and the white population (0.2 per 100,000). Males had a higher rate than females (1.2 and 0.6 per 100,000, respectively).



The majority of cases (68%) were reported from the northern region. Incidence by locality can be viewed in the map below. Cases occurred throughout the year. Because malaria is almost always acquired outside the United States, any observed temporal patterns are related to patterns of travel to endemic countries.



All cases reported a history of travel outside of the United States within the two years prior to disease onset. The majority of those with travel outside the U.S. (81%) had visited countries on the African continent. The African countries most frequently referenced included Sierra Leone (18 cases), Ghana (10 cases) and Liberia and Nigeria (5 cases each) (Figure 50). Non-African countries mentioned in travel histories included India (5 cases), Pakistan (3 cases), Honduras (2 cases), Brazil (2 cases) and Haiti and the Dominican Republic (1 case each).

The parasitic species of *Plasmodium* were identified in 69 individuals diagnosed with malaria in 2013. Specifically, 71% were infected with *P. falciparum*, 16% were infected with *P. vivax*, and 5% were infected with *P. malariae*. One case was infected with *P. ovale* and species could not be determined in 6 cases.

Information on malaria prophylaxis usage was obtained for 66 of the cases. Of these, only 20% (15 individuals) reported receiving prophylaxis for malaria, and 6 of the 15 individuals reported missing at least one dose. No deaths were known to be due to malaria in Virginia in 2013.

Malaria Incidence Rate by Locality
Virginia, 2013